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AUTHOR Bitter, Gary G.
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ABSTRACT

A survey of 46 Arizona school districts revealed that the districts use computer assisted instruction most frequently in language courses; 37 percent of the responding districts use microcomputers, but 45 percent of all microcomputers are used in only one district; use of microcomputers is planned for both administration and instruction; and respondents are interested in programs helping them more fully utilize microcomputers. The survey questionnaire also asked respondents to list computer assisted instruction programs that they could share or develop with other school districts and problems with which the Arizona State University Microcomputer Laboratory could assist districts. It was concluded from the survey that Arizona school districts are interested in educational applications of microcomputer technology but are finding utilization difficult because of lack of trained personnel and effective software. Several responses to the needs identified in the survey were recommended: courses in the educational use of computers for education majors; inservice programs on computer familiarization; workshops for software development; a program to assist districts in instructional and academic program development, educational use of microcomputers, and hardware selection; and presentations at administrator conferences and inservice programs to promote administrator computer literacy. The questionnaire is appended.
(Author/JM)

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SURVEY OF ARIZONA PUBLIC SCHOOL PRACTICES AND
NEEDS FOR COMPUTER ASSISTED INSTRUCTION

May, 1980

This study was initiated by the Working Group on
Microcomputers in Education - College of Education
at Arizona State University

Committee Members

Gary Bitter, Chair
Len Cahen
Sandy Cohn
Vern Gerlach
Norm Higgins

Don Jacobs
Dave Krus
Ed Nelson
Dick Wooton
Stan Wurster

Project Associate

Malcolm Wells

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Purpose:

The survey was designed to gather information concerning six issues:

- I) The scope of implementation of computers for instructional purposes in Arizona public schools.
- II) Specific types and numbers of microcomputers presently being used in public schools in Arizona.
- III) Applications for which the school districts intend to utilize microcomputers.
- IV) Interest in microprocessing projects in cooperation with Arizona State.
- V) Computer assisted instruction projects which might be shared or developed with other districts.
- VI) Particular problems related to the use of microcomputers which might be solved with assistance from the Arizona State University Microcomputer Laboratory.

Method:

A survey questionnaire (see Appendix A) was sent to all school districts in Arizona. A total of 46 districts completed and returned the questionnaire.

Results:

- I. The Scope of Implementation of Computers for Instructional Purposes:

Question: Please describe the scope and nature of educational uses of computers in your district. Please check those that apply and indicate the approximate number of students involved.

Table 1

	Percent of Districts Currently Offering these appli- cations	Number of Students Served by these districts	Grade Level
Intro to Computing Language(s)	37%	3294	7-12
Basic Skills--Math	26%	4216	1-12
Basic Skills--Language Arts	9%	4105	1-12
Basic Skills--Reading	11%	4317	1-12
Basic Skills--Typing	2%	20	9-12
Simulations--Social Studies	4%	85	11-12
Simulations--Business/Economics	15%	158	9-12
Simulations--Science	7%	1410	9-12
Other			
1. Computer Literacy	2%	1400	4-12
2. Math-Computer Extended Instruction	2%	1375	9-12
3. Home Economics Diet Program	2%	210	11-12

The most frequent use of computers is in computer language courses, followed by basic skills in mathematics. The presentation of computer language courses requires little or no software, and an abundance of basic skills in mathematics software readily available on the commercial market, and teacher or student prepared programs are much easier to write in this skill area than in most other skill areas.

It should be pointed out, that while 52% of the responding districts provide computer related instructional opportunities, two of the reporting districts provide 60% of the student participation.

II. Specific Types and Numbers of Microcomputers Presently Being Used in Education.

Question: Does the district currently use microcomputers for instruction?

Table 2
Microcomputers Available for Instruction

	Number Presently In Use
Apple	8
Pet	38
Texas Instruments	1
Atari	0
TRS-80	22
Other	
Holly 88	1
Monroe Classmate 88	8

While 37% of the responding districts indicated that they used microcomputers for instructional purposes, 45% of all microcomputers were being used in one district. It should be noted that relatively few of the students utilizing computer instructional opportunities in question number one were using microcomputers. The exact percentage of students using microcomputers could not be ascertained from this study

since some districts used both minicomputers (computer costing more than \$10,000) and microcomputers (computers less than \$10,000) but didn't distinguish the number of students using each type of computer.

III. Applications For Which the School Districts Intend to Utilize Microcomputers.

Question: Does the district use or plan to use microcomputers for:

- a. Accounting and/or business records
- b. Scheduling
- c. Student records
 - 1) grades
 - 2) attendance
 - 3) other (specify)
- d. Instruction
- e. Scoring/Processing tests
- f. Item analysis or other analysis of test information
- g. Other

Table 3

Current or Planned Uses of Microcomputers
(Given in Percent of Responding Districts)

	<u>N</u>	<u>%</u>
Accounting and/or business records	14	30
Scheduling	13	29
Student records	19	41
Instruction	23	51
Scoring and processing tests	13	28
Item analysis or other analysis of test information	10	22

The results indicate that planned microcomputer use includes both administrative and instructional use. Instruction was indicated by 51% of the respondents.

IV. Interest in Microcomputing in Cooperation With Arizona State.

Question: Is the district interested, in general, in cooperative micro-processing projects with Arizona State University, such as software development, exchange of information and software, workshops on computer-assisted instruction, etc.?

Table 4

Interests of School Districts
Cooperative Projects

Exchanging information and software	70%
Software development	65%
Teacher/training workshops	65%
Evaluation of instruction/needs assessment	65%

The number of affirmative responses to all four sections of question four indicates a desire on the part of the respondents to more fully utilize the new microcomputer technology in education.

V. Computer assisted instruction projects which might be shared or developed with other school districts.

Question: Please describe computer assisted instruction (CAI) projects in progress in your district which might be shared or developed with other districts through a consortium.

LIST OF RESPONSES

1. We have written and implemented CMI in reading. Math will be operational next year and language the year after.
2. None. The TRS-80's are mostly used to provide extra experiences for a few students.
3. None at this time.
4. No true CAI at this time. Instruction in programming-utilizing, etc.
5. We have some homemade programs on TRS-80 which keep score of student responses in simple algebra.
6. Not much, have some we have taken from Maricopa Community Colleges.
7. IBM 34 or Burrough's B-92.
8. Prescription Learning - Programs used in the Reading Lab. Careers Awareness Programs - Used in Adventure Center Program. Personal Programs - Developed by some teachers - For use in the Reading Center Program, (LIA and Reading Areas).
9. No CAI projects that are district developed - Those in use are contracted through the Prescription Center.
10. The status of our computer program is too unstable at this time to know what we will be doing a year from now. I am promoting micros, but District Leadership and Board has not yet been willing to commit itself to any plan for future purchase of computer equipment. The present equipment is old and much is obsolete.
11. Student developed programs related to mathematics.
12. Dallas Texas Arithmetic Program.
13. Math CAI
14. Computer Programming - Students learn to use the computer for their capabilities and their operations in a time sharing system. The students will be taught to program in the BASIC. More capable students will be introduced to programming in FORTRAN.

15. Adaptive Education Software at our Exploratory Learning Center, Miles School.
16. We are part of the Navajo County Data Processing Consortium.

VI. Particular Problems Related to the Use of Microcomputer Which Might be Solved with Assistance From the Arizona State University Microcomputer Laboratory.

Question: With what particular problems might Arizona State University microcomputer laboratory assist your district by using microcomputers in your district?

LIST OF RESPONSES

1. Particularly interested in Basic Skills in Math.
2. Unknown at this time.
3. Systems capable of school financial record keeping.
4. Act as clearing house for software - A Dissemination Center for micro information and uses. Hold a microcomputer workshop familiarizing administrators with the potentials of the micro. A general awareness and familiarity.
5. Programming - Identification of uses, etc.
6. Obtaining funds to purchase equipment.
7. Not sure at this time. We believe we will avail ourselves of help in the future.
8. Keep us abreast of available hardware and software. Newsletter of present status and uses in state. Courses available for development of personnel within district who could serve as resource people to classroom teachers.
9. A. Appropriate CAI
B. General awareness workshop
C. Productive, cost effective applications.
10. A. Software
B. Training of teachers
C. Comparisons of different microcomputers - What's the best buy?

11. Cues testing and record keeping
12. Instruction
13. Administrative/Financial
14. Most of our needs are for the future. However, guidance in purchase and use would be beneficial.
15. Hopefully helping us determine the feasibility of using microcomputers.
16. A. Management - 1) Basic skills program (daily tracking)
2) Scheduling and attendance
3) Parent reporting
4) Score/process diagnostic testing
B. Instruction - 1) CAI programs - Develop and reinforce basic skills
2) Intro to computer programming (staff and students)
3) Individualized programs for specific learning needs.
17. Programs presently in use that are successful.
Background in basics of implementing CAI programs.
Assistance in "setting-up" pilot program(s).
Assistance in evaluation.
In-service for those involved.
18. Develop good computer literacy materials dealing with social aspects and careers - not programming.
19. A. Test analysis comparison of micro brands - ESP, Apple, PET, TRS-80, Atari, Ohio Scientific, and CompuColor.
B. Test analysis comparison of printers (brands for micros).
C. Clearing house for Educational Software (both commercial and teacher written).
D. Seminars of symposiums in computer education (Hardware and Software).
E. Make computer applications a mandatory part of teacher training in math and science.

20. A. Assessing products on the market.
B. Developing program of instruction.
21. In-service programs for academic areas.
22. Developing programs (Software).
23. Consulting services for program and development.
24. Programming.
25. Scheduling of courses.
Setting up Software for use in the individual departments.
Guidance in the purchase of appropriate computers.
26. Developing a program.
27. Consult our consortium personnel.

CONCLUSIONS

This survey indicates a keen interest of Arizona school districts in the potential educational applications of microcomputer technology. The survey indicates that most districts are implementing microcomputers on a pilot basis but are finding full utilization of this new technology very difficult by virtue of the lack of trained personnel and the difficulty of obtaining effective software.

RECOMMENDATIONS

It is the opinion of the committee that if the educational community is to capitalize upon the enthusiasm with which this new technology has been accepted by Arizona educators, a prompt response to the current interest and need is essential.

There exists, at this time, three broad areas of vital need:

1. Well trained personnel in the use and implementation of this technology.
2. Identification of and access to effective software.

3. Assistance in planning microcomputer systems and programs.

RECOMMENDED RESPONSES TO THE ABOVE NEEDS

A. NEED - TRAINED PERSONNEL

Response:

1. Develop courses in educational use and implementation of microcomputers for education majors.
2. Provide traveling in-service computer familiarization programs on a district by district basis throughout the state of Arizona.

B. NEED - EFFECTIVE SOFTWARE

Response:

1. Provide a summer program and regular year workshops for software development. Participant selection by invitation to insure coverage of targeted instructional areas.
 - (a) Develop a strategy for program design by experienced teachers with no necessary programming experience - Have programs coded (written for the computer to understand) by students or programmers.
 - (b) All developed programs be made cooperatively available to all districts.
2. A summer review and regular year workshop on software review and evaluation by grade and subject content area. Results of this review to be disseminated to all districts.

C. NEED - ASSISTANCE IN MICROCOMPUTER SYSTEM PLANNING

Response:

1. A summer program or regular year seminar to assist districts in general instructional and/or academic program development, integration of microcomputers in education, and microcomputer hardware selection.

D. NEED - KNOWLEDGE OF MICROCOMPUTER POTENTIAL AMONG
DISTRICT ADMINISTRATORS

Response:

1. Participate with computer literacy discussions in principal and superintendent conferences.
2. Provide in-service programs for district administrators at local and state levels.

APPENDIX A

ARIZONA STATE UNIVERSITY
College of Education

Tempe, Arizona 85281

May 15, 1980

Dear Superintendent:

The College of Education is in the process of developing a microcomputer demonstration laboratory. One of the main purposes of the laboratory is to assist school districts, individual schools and teachers in the evaluation of microcomputer and microcomputer programs prior to purchase. Support will also be available to implement the microcomputer(s) into the classroom. In addition, the laboratory will act as a clearing-house for microcomputer software which users develop and wish to share with others. The University plans on using the laboratory to support courses as well as furnish faculty the opportunity to pursue microcomputer research projects.

Therefore, to develop the microcomputer laboratory to meet the needs of your school district, please have your appropriate personnel fill out and return the enclosed questionnaire.

Thank you for your cooperation.

Sincerely,

Gary G. Bitter, Chair
ASU College of Education
Microcomputer Study Group

Leonard S. Cahen
Associate Dean for Research
and Development

GGB:cd
Enclosure

Computer Assisted Instruction Needs Assessment

Arizona State University

May, 1980

1. Please describe the scope and nature of educational uses of computers in your district. Check those that apply and indicate the approximate number of students served.

	<u>Currently offered?</u>		<u>Students served annually</u>	<u>Grade levels</u>
Intro to computing language(s)	yes	no	_____	_____
Basic skills--Math	yes	no	_____	_____
Basic skills--Language Arts	yes	no	_____	_____
Basic skills--Reading	yes	no	_____	_____
Basic skills--Typing	yes	no	_____	_____
Simulations--Social Studies	yes	no	_____	_____
Simulations--Business/Economics	yes	no	_____	_____
Simulations--Science	yes	no	_____	_____
Other (specify) _____				
Other (specify) _____				

2. Does the district currently use micro-computers for instruction? (Circle all that apply and indicate number.)

Apple	yes	no	_____
Pet	yes	no	_____
Texas Instruments 99/4	yes	no	_____
Atari	yes	no	_____
TRS-80	yes	no	_____
Other (specify) _____	yes	no	_____

3. Does the district use or plan to use micro-computers for:

If Yes, Please Describe Briefly

- | | | | |
|--|-----|----|-------|
| a. Accounting and/or business records | yes | no | _____ |
| _____ | | | |
| b. Scheduling | yes | no | _____ |
| _____ | | | |
| c. Student records | | | |
| 1) grades | yes | no | _____ |
| 2) attendance | yes | no | _____ |
| 3) other (specify) | | | _____ |
| _____ | | | |
| d. Instruction | yes | no | _____ |
| _____ | | | |
| e. Scoring/processing tests | yes | no | _____ |
| _____ | | | |
| f. Item analyses or other analyses of test information | yes | no | _____ |
| _____ | | | |
| g. Other | | | _____ |
| _____ | | | |

4. Is the district interested, in general, in cooperative microprocessing projects with Arizona State University, such as software development, exchanging information and software, workshops on computer-assisted instruction, etc.?

- | | | |
|--|-------|----|
| Exchanging information and software | yes | no |
| Software development | yes | no |
| Teacher/training workshops | yes | no |
| Evaluation of instruction/needs assessment | yes | no |
| Other(s) (specify) | _____ | |
| _____ | | |

5. Please describe computer assisted instruction (CAI) projects in progress in your district which might be shared or developed with other districts through a consortium.

6. With what particular problems might the Arizona State University micro-computer laboratory assist your district in solving by using micro-computers in your district?

Name of school official and district completing this report

Name _____ / Title _____ Phone Number _____

School District _____ / Address _____

Names and addresses of other administrators, teachers, etc. in your district interested in educational use of computers.

Name _____ School _____ Address _____

Name _____ School _____ Address _____

Name _____ School _____ Address _____

PLEASE RETURN THIS SURVEY TO: Dr. Gary G. Bitter
College of Education
Payne Hall, B225
Arizona State University
Tempe, Arizona 85281